

Balloonborne Observations of Mid-Latitude Hydrofluoric Acid and Carbonyl Fluoride by JPL/MkIV Interferometer.

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Simultaneous measurements of molecular burdens of stratospheric trace gasses have been made by the Jet Propulsion Laboratory MkIV interferometer on board stratospheric research balloons. Five balloon flights were conducted between 1989 and 1993 to record infrared solar absorption spectra at sunset and sunrise. Data for the geographic latitudes of 3503:1.00 N were acquired from balloon float altitudes down to tangent heights of ~15 km. The data was analysed using a least squares spectral fitting algorithm which adjusted an assumed volume mixing ratio (vmr) profile of the gas until the line-by-line calculation best matched the observed spectrum.

Volume mixing ratio profiles of hydrofluoric acid (HF) and carbonyl fluoride (COF₂) derived from the September 1989, 1990, and 1992 balloon flights are presented. The major difference between the last and the earlier flights was the presence of volcanic aerosols from the June 1991 eruption of Mt. Pinatubo. We compare the vmr profiles of the two gasses obtained by JPL/MkIV with those measured by the Atmospheric Trace Molecule Spectroscopy Experiment (ATMOS) during its Atlas I mission. The mean measured HF column abundance above 22 km are presented and any observed trend compared to the projected increase in stratospheric fluorine levels. A value of COF₂ to HF column ratio is estimated for September 1989, 1990, and 1992 and compared to model predictions.

1. 1993 Fall Meeting
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4. A
5. (a) None
(b) 0340
- Middle atmosphere
- composition and chemistry
6. No preference
7. 0%
8. \$50.00 cheque enclosed
9. C
10. Schedule paper after
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11. No